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# CRS Issue Statement on R&D to Meet National Needs and Priorities

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The science and engineering community, advocacy groups, and the federal government assert that domestic investment in research and development (R&D) is a critical component to U.S. national and international policy. Investment in R&D is key to maintaining U.S. scientific and technical ability, developing the U.S. scientific and engineering workforce, enhancing domestic economic growth, continuing U.S. global industrial competitiveness, and advancing national priorities. Such priorities include homeland and national security, public health and safety, environmental protection, and energy security. Congress influences both the federal and national investments in R&D. Congressional policymakers address multiple R&D policy concerns. Among these policy concerns are fiscal issues, such as what federal resources should be allocated to R&D and how might they be optimally distributed on a national scale, and strategic issues, such as what national challenges can be effectively addressed through the R&D enterprise and how federally funded R&D will assist in meeting national priorities. With increasing fiscal constraints, Congress will likely be forced to make difficult choices regarding the federal R&D investment. Investment in R&D is one vital mechanism for spurring innovation, but the benefits of such investment often accrue over long time scales. The level of federal R&D funding will likely be a contentious issue. Calls for fiscal discipline will likely compete with those advocating increases in federal R&D support. Consequently, Congress is challenged with determining the optimum level of federal R&D investment while maintaining a balance among R&D efforts with near-term gains and those requiring sustained support to provide longer-term benefits.

Often, R&D is a federal/private partnership, with roles and responsibilities for funding and performing R&D shared among many stakeholders. The federal government leverages its investment by encouraging the private sector to commercialize federally funded R&D discoveries by supporting technology transfer, maintaining intellectual property rights, and spurring industrial innovation. Private sector support of R&D has grown, but the distribution of these funds has been heavily weighted towards development. At the same time, the federal government has responded by redistributing limited federal resources, focusing increasingly on more fundamental research. Some experts have expressed concerns regarding the widening gap that often exists between a laboratory discovery and the private sector's willingness to transform the discovery to a final commercial product. This phenomenon results in a failure to exploit the economic potential of R&D results. This widening gap, combined with an increasingly competitive global technology and business environment, has stirred congressional debate regarding the best ways to foster innovation and harness the national entrepreneurial spirit.

Prioritization and coordination of the R&D investment are challenging topics that raise complex policy issues. R&D is a diverse activity conducted by many federal agencies and often across traditional lines of agency authority. Coordination and oversight of multi-agency initiatives is an oversight challenge facing both the executive and legislative branches. Multiple tensions challenge traditional notions of research organization, leadership, and funding. These tensions include those among scientific and engineering disciplines, geographic areas, and specific R&D institutions; those between investigator-driven and federally directed R&D; and those over the scope and scale of federal R&D investments. The desire to eliminate duplication and improve synergies in the federal R&D portfolio may result in an increased congressional focus on strategic planning in the context of tightening fiscal conditions.

Recent Congresses have enacted measures setting priorities and authorization and appropriation levels for federal R&D investments. These priorities have not been without controversy. Advocates have called for greater efforts to stimulate private sector investment in R&D; increased federal funding for the translation of research ideas into products, as well as for the

construction of R&D infrastructure and facilities; greater support for students pursuing degrees in science and engineering; and alignment of authorized and appropriated federal R&D funding levels. The failure of appropriated federal R&D funding to reach authorized levels has led to questions in the industrial and academic R&D communities as to whether the actions taken by Congress have been sufficient to meet national needs. Congress may consider additional legislation to provide for assessment of current programs and prioritize federal R&D resources.

Another area of potential congressional interest is the ability of the federal government to spur private sector investment in R&D facilities and development of the domestic science and engineering workforce. The 111<sup>th</sup> Congress may continue to build on efforts by previous Congresses to foster future generations of scientists and engineers and to increase the number of U.S. students pursuing degrees in science and engineering disciplines. Some have called for restraint in such efforts to prevent a misalignment between the knowledge and skills of the workforce and those in demand by the private sector. Tax incentives, such as the research and experimentation tax credit, are one approach used to spur further private investment in R&D. Additional mechanisms by which the private sector can be encouraged to support R&D and/or to take the fruits of federally funded R&D and develop it into commercial products, potentially creating value, wealth, and jobs and improving quality of life, may also feature prominently in the upcoming policy debate.

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